Commentary

Methods for Patient-Level Costing in the VA System: Are They Applicable to Canada?

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In his article "Determination of VA Health Care Costs," Barnett (2003 [this issue]) describes various methods available to estimate costs in the U.S. Veterans Affairs (VA) health care system. These methods include direct measurement, pseudo bills combining VA patient-level utilization data and non-VA cost lists, cost functions based on regression analysis using non-VA cost estimates, and average cost databases. The need for these methods arises from the fact that VA hospitals do not prepare patient bills, the primary source of health care costs used in U.S. health economic studies.

Barnett (2003) suggests that the principles of cost determination described in his article can be applied to other settings where billing data are not available. This is the case in Canada, where acute-care hospitals are publicly funded through global operating budgets. Because very few hospitals have information systems that produce reliable patient-level costing data, Canadian health economists rely on similar cost-estimation methods to those detailed by Barnett. The parallels between VA health care costing methods and those used by Canadian investigators are detailed in the remainder of this commentary.

THE DECISION SUPPORT SYSTEM (DSS)

The Health Economics Resource Center (HERC) average cost database and the DSS are attempts to overcome the absence of billing records in the VA health care system. Both produce estimates of costs for all individual inpatient admissions; however, the estimation techniques are different. The HERC database estimates rely on cost functions based on non-VA hospital cost data, while the DSS employs a top-down fully allocated costing technique based on VA hospital cost and utilization data. In Canada, a similar effort has been made by two provincial hospital costing initiatives: the Ontario Case Costing Initiative (OCCI) (Ontario Hospital Association and Ontario Ministry of Health OCCPJP & PC 1999) and the Alberta Costing Partnership (ACP) (Health Resourcing Branch 2002). In both cases, selected hospitals (6 in Alberta and 21 in Ontario) produce cost estimates for individual inpatient encounters using techniques similar to the VA DSS. Inpatient cost estimates are based on standardized fully allocated costing methods. At the time of publication, both ACP and OCCI had available data based on fiscal year 2000-2001.

The usefulness of these cost data in prospective economic evaluations is somewhat limited compared to the HERC and DSS databases. Potentially, cost records from the HERC database and DSS can be extracted to directly cost all hospitalizations for patients participating in VA economic trials. However, the proportion of Canadian hospitals involved in the OCCI or ACP is small. Therefore, it is unlikely that hospital cost records would be available for all hospitalizations for patients participating in a Canadian prospective economic evaluation. Despite this limitation, OCCI and ACP data have proven to be among the best source of costing data in Canada. Both have publicly available data on the average length of stay and average cost per hospitalization according to diagnosis. Data from individual hospitals participating in the provincial costing initiatives are useful in other costing approaches.

PSEUDO BILLS

Pseudo bills are another approach suggested to estimate health care costs in the VA health care system. In this method, itemized lists of health care resources are combined with reimbursement or charge schedules to estimate the cost of an encounter. For Canadian researchers, cost data from individual hospitals participating in provincial costing initiatives can be used in place of the reimbursement schedules suggested by Barnett (2003). Part of the process of producing patient-level costs in ACP and OCCI is assigning costs to

intermediate products such as diagnostic tests, surgical procedures, and daily costs in specific types of wards. These costs can then be combined with health care utilization data collected in prospective clinical trials to create a type of pseudo bill estimate.

Barnett (2003) also suggests creating pseudo bills for inpatient stays by estimating the Medicare reimbursement for the stay. This can be accomplished by multiplying the relevant diagnosis related group weight used in the prospective payment system by a cost factor. The Institute for Health Economics in their publication *A National List of Provincial Costs for Health Care: Canada 1997/ 98* (Jacobs et al. 2000) suggested a similar method for estimating inpatient costs. In what they called the cost per weighted case approach, a standard cost of a hospitalization related to a specific case mix group (CMG) in a particular province can be derived by multiplying the resource intensity weight (RIW) of the CMG by the average cost per weighted case in the province of interest. The standard cost per weighted case by province is provided in the publication. The RIW of specific CMGs can be obtained from the Discharge Abstract Database produced by the Canadian Institute for Health Information (1994). CMGs and their respective RIWs are subcategorized by age and complexity level.

COST PREDICTION MODELS

Cost prediction models (Willan and O'Brien 2001) are also suggested as a method to derive estimates of VA inpatient costs. In this approach, coefficients from a regression equation using data from non-VA hospitals are combined with VA utilization data to create inpatient cost estimates. The cost and utilization data provided by participating OCCI and ACP hospitals can be used to create similar cost prediction estimates for Canadian inpatients.

This approach was used by O'Brien et al. (2000) in an economic evaluation of Canadian participants from a clinical trial of hospitalized patients randomized to either regular heparin or molecular weight heparin. Use of selected health care resources during hospitalizations was collected prospectively during the trial. Records for 1,044 hospitalizations from a participating OCCI hospital with admitting diagnosis identical to those of patients entering the trial (unstable angina, non-Q-wave angina) were used to create a multivariable regression model. Total costs were used as the dependent variable, while resource utilization variables identical to those collected in the trial were used as independent variables. The coefficients of the cost function were combined with the utilization data collected for individual patients in the trial to estimate inpatient costs.

CONCLUSION

The Canadian health care system is characterized by public funding, and this single-payer system has resulted in hospitals being funded by global budgets. The downside of this system for the health economist conducting cost-effectiveness studies is that patient-specific billing and/or cost data are not readily available. The VA system in the United States faces similar problems and has been innovative in developing several approaches to patient-level costing that can be generalized, in different ways, to the Canadian setting.

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